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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,345	11/14/2001	Takeshi Konno	107443-00014	6928

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EXAMINER	
HUSON, MONICA ANNE	
ART UNIT	**PAPER NUMBER**
1732	

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/987,345	KONNO, TAKESHI	
	Examiner	Art Unit	
	Monica A. Huson	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the RCE filed 28 April 2006.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 USC 102(b) as being anticipated by Hunkar (U.S. Patent 3,941,534). Hunkar shows that it is known to carry out a method for controlling an injection molding machine in order to control the movement of a molten resin in a heating cylinder of the injection molding machine, the injection molding machine including a screw arranged within the heating cylinder to be rotatable and to be linearly movable and having a flight of a pitch P, the molten resin being moved in a forward direction during a plasticization process and an injection process (Abstract; Column 7, lines 13-27; Column 8, lines 28-43), the method comprising the steps of linearly moving the screw backwards relative to the forward feeding direction of the molten resin at a constant backward speed (Column 6, lines 45-48; Column 8, lines 16-18; Column 10, lines 6-19; Column 28, lines 24-35); controlling density distribution of molten resin at a nose portion of the screw while moving the screw backwards (Column 6, lines 50-58; Column 27, lines 37-63); and simultaneously rotating the screw in the forward feeding direction at a rotation speed corresponding to the constant backward speed, after completion of the injection process (Column 28, lines 24-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (U.S. Patent 4,879,077), in view of Hunkar. Regarding Claim 1, Shimizu shows the basic process, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, lines 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the screw (Figures 3-5; Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57; It is interpreted that the control equation applies to backward movement of the screw since backward movement is controlled in a similar fashion as frontward movement is controlled.). The examiner notes that a specific "synchronization ratio" is not

explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized, i.e. when the position of the flight does not move. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary synchronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards or moving the screw backwards at a constant speed while rotating it after completion of the injection process. Hunkar shows that it is known to carry out a method including controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards (Column 6, lines 50-58; Column 27, lines 37-63), and moving the screw backwards at a constant speed while rotating it after completion of the injection process (Column 6, lines 45-48; Column 8, lines 16-18; Column 10, lines 6-19; Column 28, lines 24-35). Hunkar and Shimizu are combinable because they are concerned with a similar technical field, namely, methods of controlling molding operations. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Hunkar's control parameters during Shimizu's molding process in order to insure formation of

an article which meets end-use specifications that are dependent upon density of the molding material.

Regarding Claim 2, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 3, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, lines 60), comprising the steps of, defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the

screw (Figures 3-5; Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards or moving the screw backwards at a constant speed while rotating it after completion of the injection process. Hunkar shows that it is known to carry out a method including controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards (Column 6, lines 50-58; Column 27, lines 37-63), and moving the screw backwards at a constant speed while rotating it after completion of the injection process (Column 6, lines 45-48; Column 8, lines 16-18; Column 10, lines 6-19; Column 28, lines 24-35). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Hunkar's control parameters during Shimizu's molding process in order to insure formation of an article which meets end-use specifications that are dependent upon density of the molding material.

Regarding Claim 4, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 5, Shimizu shows the basic process as claimed, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, line 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant linear backward speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards or moving the screw backwards at a constant speed while rotating it after completion of the injection process. Hunkar shows that it is known to carry out a method including controlling a density distribution of

molten resin at a nose portion of the screw while moving the screw backwards (Column 6, lines 50-58; Column 27, lines 37-63), and moving the screw backwards at a constant speed while rotating it after completion of the injection process (Column 6, lines 45-48; Column 8, lines 16-18; Column 10, lines 6-19; Column 28, lines 24-35). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Hunkar's control parameters during Shimizu's molding process in order to insure formation of an article which meets end-use specifications that are dependent upon density of the molding material.

Regarding Claim 6, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 7, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5,

lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, line 60), comprising the steps of defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant linear backward speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards or moving the screw backwards at a constant speed while rotating it after completion of the injection process. Hunkar shows that it is known to carry out a method including controlling a density distribution of molten resin at a nose portion of the screw while moving the screw backwards (Column 6, lines 50-58; Column 27, lines 37-63), and moving the screw backwards at a constant speed while rotating it after completion of the injection process (Column 6, lines 45-48; Column 8, lines 16-18; Column 10, lines 6-19; Column 28, lines 24-35). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Hunkar's control parameters during Shimizu's molding process in order to insure formation of an article which meets end-use specifications that are dependent upon density

of the molding material. Furthermore, Shimizu shows the basic process as claimed as discussed above, but does not explicitly show variations of the synchronization of the screw rotation. However it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 8, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than the backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 10, Shimizu shows the process as claimed as discussed above in the rejection of claim 9, including showing that it is known to control an injection molding operation by performing a plasticization/measuring process and an injection process (Column 2, lines 18-26). Shimizu also shows that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and to define a rotation

speed of the screw by dividing the linear (backward, as in Yamazaki) speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 11, Shimizu shows the process as claimed as discussed above in the rejection of claim 10, including showing that it is known to define a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). Furthermore, the examiner also notes that Shimizu does not explicitly define a synchronization ratio, as used in the formula in Claim 11. However, since the synchronization ratio of Claim 11 cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.).

Regarding Claim 12, Shimizu shows the process as claimed as discussed above in the rejection of claim 10, including showing that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65). The examiner notes that a specific "synchronization

ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A. Huson whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monica A Huson

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May 15, 2006